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Reverse Logistics Activities in Enterprises and Implementation Reasons

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Abstract

Many businesses have obtained cheap raw materials thanks to recycling and recovery activities. The aim of this study is to describe the logistics activities performed by businesses and to identify the main reasons of reverse logistics appliance. The research is a case study defined as "integrated multi-case design" type. For this purpose, 23 industrial enterprises were examined in the scope of sample. Because the data obtained via unstructured interview form, they have qualitative characters. The single answers were used as analysis unit in this study, descriptive and discourse analyses were performed on qualitative data. Some sentences were quoted directly. The obtained results were submitted to the approval of the respondents. Thereby, it was contributed to construct validity of the research by creating evidence chain. It seems reasonable to conclude that the most commonly applied ones among reverse logistics operations are storing, selling to a mediary, destruction, recycling, regulation of customer returns new repackaging and resale. The results showed that reverse logistics operations were performed for some reasons such as providing raw materials, saving in production, raising the level of consciousness of environmental responsibility and awareness taking part in social responsibility project and consumer rights.

Key Words: *Recycling; Recovery; Customer Returns; Çorlu-Çerkezköy.*

JEL classification: M19

Introduction

Reverse logistics operations have become an important part of not only the business world today, but also the social life. For example, recovery and recycling are stated to be "part of everyday life for individuals and enterprises in New Zealand" (Mollenkopf, 2003). These operations also improve awareness of the community in terms of social responsibility and increase the importance given to environmental cleanliness (Kucuk 2012: 191). In business life, produced goods and services gain value when they are supplied to the right consumer, at the right time and in the right place and in the desired manner. In this process, costumer returns may occur due to various reasons such as malfunction, breakage, crushing or incorrect delivery and a reserve flow to the manufacturer or to the supplier takes place as a result. Thus, reverse logistics operations emerge. When these operations are managed well, enterprises are able to remanufacture goods by obtaining cheap raw materials through recycling and recovery activities.

It is always a matter of concern how enterprises approach and manage reverse logistics as a business function and to what degree enterprises participate in this activity. Reverse logistics operations such as recycling-recovery activities or customer returns continue to be a subject of interest for researchers, who investigate these with qualitative and quantitative research methods. On the other hand, reducing the share of reverse logistics cost in total costs is a major issue. What sort of reverse logistics operations are carried out by enterprises, especially industrial enterprises, and why these operations are important to enterprises are the main questions of this study. From this point, this study aims to identify reverse logistics operations carried out by industrial enterprises in the province of Tekirdag, which hosts important industrial organizations of Turkey, and determine reverse logistics implementation reasons of these enterprises.

There are authors in the literature who define reverse logistics (Kulwiec 2006, Stănciulescu 2011, Senthil and Sridharan 2014, Grellier et al. 2015) and who specify what sort of reverse logistics operations are applied (Thierry et al. 1995: Demirel and Gökçen, 2008; Şengül, 2011; Çekerol, 2013; Temur et al. 2015). As well as authors stating the importance of reverse logistics (Karadoğan 2011, Küçük 2012, Greve and Davis, 2015), there are also studies that point out reasons of reverse logistics implementation (De Brito and Dekker 2002, Şengül 2011, Acar and Kara 2014, Temur et al. 2015, Gupta and Veerakamolmal 2000, Şengül 2011).

Initially, the study defines reverse logistics using the relevant literature and introduces its scope and operations, then goes on to outline the importance, benefits and implementation reasons of reverse logistics. Representatives of enterprises located in the districts of Corlu and Cerkezkoy of the province of Tekirdag and the Luleburgaz district of the province of Kirklareli constitute the population of the study. The study sample consists of representatives of 13 industrial enterprises in this region, who have experience in reverse logistics. These enterprises were examined in their native environment with face-to-face interviews. In addition, another 10 enterprise operating in the same region were sent interview forms for data collection. In this regard, the study employs an "*integrated multi-case design"* (Yıldırım and Şimşek, 2008: 291-292). For the purposes of this study, "the maximum diversity sampling" was used, which is a purposive sampling method. The data collected using the Unstructured Interview Method were expressed descriptively and also subjected to "discourse analysis". It was seen at the end of the study that enterprises performed recycling by collecting, transporting and parsing wastes and reduced reverse logistics costs by carrying out reverse logistics operations in workshops. It was also found that the awareness of environmental and social responsibility increased with the support of the community.

Literature Review

It is possible to find many definitions for reverse logistics in the literature. Theoretically, reverse logistics is also referred to as "green logistics", "waste logistics", and "return logistics". In 1980s, reverse logistics was considered to be "a product movement in opposite direction from the customer to the manufacturer" (Rogers and Tibben-Lembke, 2001). Gür (2009) states that "reverse logistics includes all logistics activities from used-up products to reusable products in the market". On the other hand, it has been found in the study conducted by Dirik (2012) that 39% of enterprise managers state that the first concept that comes to their minds regarding reverse logistics is "recycling". Avcı (2014) points out that "*green logistics*" and

"*recycling logistics*" are different concepts and claims "not every green logistics activity is a recycling logistics activity." According to the author, recycling should be a sub-component within logistics and recycling flow to reduce wastes in costumer returns should be controlled within supply chain management. According to Logistics Glossary (2015), reverse logistics is "carrying damaged, returned, expired, obsolescence, unwanted, repairable goods and packaging materials back to the point of origin after being delivered to the customer". The Council of Logistics Management defines reverse logistics as "source reduction, recycling, waste disposal and management, substitution and reuse of materials". American Reverse Logistics Executive Council's definition is "the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal." (Temur et al. 2015: 4). According to Kulwiec (2006), reverse logistics involves recycling and reuse of materials contained in a product and its packaging, it is a departure from landfilling or incinerating used-up materials. Keskin (2012) states that reverse logistics in the production industry "involves the movement, storing and handling of goods from the customer to the vendor or manufacturer and also includes reverse flow of defective products, expired materials, waste packaging materials or customer returns due to any reason". Stănciulescu (2011) defines reverse logistics as "the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or for proper disposal". According to the author, reverse logistics also includes the processing of returned merchandise caused by damage, seasonal inventory, restock, salvage, recalls and excess inventory. According to Senthil and Sridharan (2014), reverse logistics is "a part of return management within the process of supply chain management". Also, Grellier et al. (2015) points out that reverse logistics involves subjects such as end-of-life products, repair, spare parts, packaging, warehouse and plant selection, etc.

Reverse Logistics Activities

Reverse logistics activities consists of operations such as collection, inspection-sorting, product refurbishing, product cannibalization, partial disposal, recycling, remanufacturing, repair/reuse, redistribution, etc. These processes can be briefly explained as follows (Thierry et al. 1995: 117-125; Demirel and Gökçen, 2008: 905; Şengül, 2011: 416-418; Çekerol, 2013: 20; Temur et al. 2015: 12-16):

Collection: Taking used up products from consumers or retailers using 3rd party logistics providers for purposes of recovery-recycling activities.

Inspection-Sorting: The process of checking and parsing returns for usable parts.

Product Refurbishing: The process of improving the quality of the product through disassembly before delivery to the consumer or after necessary checks in the case of returns. Product refurbishing seems to increase the life and quality of the product.

Product Cannibalization: The process of taking a usable part of a used or end-of-life product and reusing the part for repair or remanufacturing purposes.

Parts Recovery: Taking parts to be used from a used product and using elsewhere.

Disposal: Landfilling and/or incinerating of unusable parts of used products.

Recycling: Reusing materials such as paper, plastic, glass, metal, and wood with chemical and physical methods.

Remanufacturing: Applying disassembly, inspection, assembly, and final check processes to damaged parts of used products.

Repair/Reuse: Restoring used products to usable condition after physical damages.

Redistribution: Delivering reusable parts of used products to suppliers and their place in the market.

Reverse logistics activities described above are used in the course of reverse flow according to product features, appropriate quality standards and enterprise's workshop features and customer returns are managed with a coordinated work between relevant departments of the enterprise as shown in Figure 1.

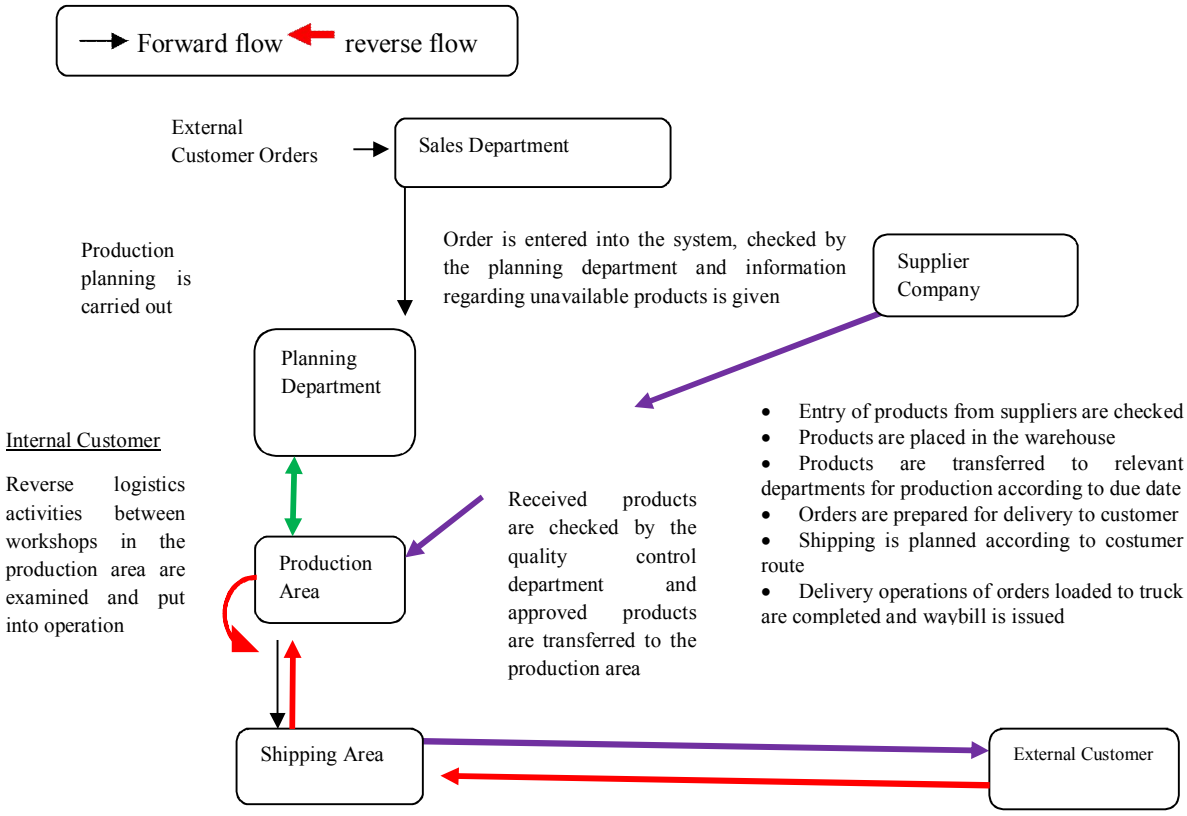

Figure 1: *The reverse logistics process between internal and external customers in industrial enterprises*

Source: Kayar, 2015.

The Importance of Reverse Logistics

Recycling firms try to create cheaper raw material by collecting and sorting waste in order to create economic value. To this end, worn, old, defective, faulty, low quality or broken products and customer returns are subjected to recycling, whereas reusable parts are used in refurbishing by adding to another product. Certain wastes are disposed of through landfilling and/or incinerating or in some cases given away to other organizations. Factors that increase the importance of reverse logistics are listed as follows (Taş, 2009: 12):

i. The rate of returned products is almost 50%.
ii. Reverse logistics makes it possible to increase the value and redistribute products which were previously scrapped by subsidiary industry and worldwide markets.
iii. The number of laws causing recalls has increased.
iv. There is pressure on enterprises to dispose of hazardous waste.
v. The fact that landfilling is expensive and has a limited capacity, repackaging, remanufacturing and recycling activities are more common and more feasible.

Stănciulescu (2011) indicates that environmental saving as a component of environmental sustainability, return percentages, opportunities for sustainable management of reverse logistics, threats for reverse logistics due to global instability and activities performed as strategic weapons are important in reverse

logistics. Karadoğan (2011) points out that reverse logistics prevents poor transportation and payment delays in recycling payments. The author also states that reverse logistics facilitates return processes, labeling, barcoding, order processing, waybill processing and increases the efficiency of warehouse activities. Nakıboğlu (2007: 185) lists benefits of reverse logistics for enterprises as "value recovery", "profit maximization", "fulfillment of environmental liabilities", and "improved customer relationship management". Küçük (2012: 191) suggests that enterprises starts categorizing and collecting their wastes with the development of reverse logistics, it is possible to regain these wastes to the economy, the public awareness has improved and the importance given to environmental cleanliness has increased. According to Greve and Davis (2015), enterprises can increase their income with reverse logistics. The authors explain these increased incomes as return income, protected profits, customer loyalty, benefits of disposal, and increasing recovery prices.

Reasons of Reverse Logistics Implementation in Enterprises

Some authors collect reasons of reverse logistics implementation under three titles: "economic", "marketing" and "legal" (De Brito and Dekker, 2002; Şengül, 2011: 413-415; Acar and Kara, 2014: 352; Temur et al. 2015). 7). Gupta and Veerakamolmal (2000) list these reasons as "economic", "environmental" and "operational" reasons. In addition, Şengül (2011: 413-415), Acar and Kara (2014: 352) state that "asset protection" and "corporate responsibility" are among reasons of reverse logistics implementation as well.

Economic Reasons: According to Gupta and Veerakamolmal (2000), economic reasons are on the rise as a result of the increased use of consumer goods in recent years. Products are consumed rapidly and quality of scraps improves with shorter product life cycle.

With its economic aspect, reverse logistics provides both direct and indirect benefits for enterprises. Direct benefits include optimized use of raw material, reduced disposal costs, increased product value and increased customer satisfaction, whereas "the green" image, improved of customer-manufacturer relationship are among indirect benefits of reverse logistics (De Brito and Dekker, 2002; Şengül, 2011: 413-415; Acar and Kara, 2014: 352).

Environmental Reasons: Groundwater pollution and airborne toxins that threaten human health are environmental risk factors. Storage in inappropriate environmental conditions is another important environmental reason (Gupta and Veerakamolmal, 2000). Acar and Kara (2014: 352) consider environmental reasons under the title "asset protection and corporate responsibility".

Operational Reasons: There are certain factors required to be determined for operational reasons of reverse logistics implantation. These are as follows (Gupta and Veerakamolmal, 2000):

i. The number of machines required to disassembly returned products
ii. The machine value for more economic machines
iii. The new market value of parts obtained as a result of disassembly
iv. The choice of machines with a higher or equal disassembly time efficiency to be able to meet the demand

Returns within the enterprise are expected to be sorted out by solving operational problems. For example, it is easier for employees in the enterprise to understand "one or more of reverse logistics operations such as product acceptance, return, review, refurbishing, transfer and redesign" (as cited in Karaçay, 2008: 318) and "repair, product refurbishing, parts recovery, remanufacturing, product cannibalization and recycling operations" (Bulut and Deran, 2008: 333-334; Çekerol, 2013: 20) and these are among operational applications that can be used for process improvement in reverse logistics.

Marketing Reasons: The concept of "green" has become more important in recent years and has been playing an important role in consumer's enterprise and product selection. An enterprise which accepts customer returns, repairs or refunds defective products and has a good quality assurance policy is more likely to be preferred. Recovery-recycling activities in question is possible with a good marketing strategy and products find their places in the market with high cost efficiency. De Brito and Dekker (2002) and Şengül (2011: 413-415) points out that enterprise use reverse logistics operations with marketing purposes. Yılmaz (2010), on the other hand, mentions that consumers develop "an image of second quality product" for products that can be reused after recycling and highlights the lack of awareness in this regard. Today's consumers have a higher awareness of environmental and social responsibilities. Yıldız (2013) states that awareness campaigns carried out with "flyers" are insufficient to sustain recycling activities and conscious consumers are needed to collect packaging wastes. With marketing, each process in which recovery-recycling activities can be implemented benefits the manufacturer, the consumer and the national economy.

Legal Reasons: Legal reasons are among reasons of reverse logistics implementation (Thierry et al., 1995; Fleischemann et al. 2001; De Brito and Dekker, 2002; Şengül, 2011: 413-415; Acar and Kara, 2014: 352). In order to protect the rights of consumers (e.g. right to return a product), legislative regulations in many countries hold enterprises responsible for collecting a certain portion of their total production. Çekerol (2013: 187) states that "the European Union developed 'green laws' and gave great importance to application of these laws, for example; manufacturers, distributors, and retailers must recycle at least 60-75% of their packaging wastes within the scope of the German Waste and Packaging Law". The author also points out that Germany plans to manufacture cars that can be recycled. Temur et al. (2015: 8) suggests that "legislative regulations will have requirements regarding collection and reuse of end-of-life products, waste management, waste reduction, and increased material recycling".

Research and Methodology

The Model, Type, Pattern and Sample of Study

This study does not have a previously determined hypothesis to test since it has a qualitative character and is based upon "The Case Study Research Model". This model aims to identify the depth and width of a unit in the population (individual, family, school, hospital, association, etc.), its relation with itself and its environment and tries to make a judgment on the unit. These are also referred to as "monographic" studies (as cited in Karasar, 2014: 86). In this study, it was aimed to identify reasons of reverse logistics implementation, the size of the sample was increased by including enterprises from various industries and an attempt was made to generalize the results obtained. This study also employs "the document review model" and benefits from "reviewing documents on the internet, books, articles, reports, assertions, etc." (Yurtseven et al, 2013: 37). On the other hand, this research is a case study. Yin (2003: 13-14) states that a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context and boundaries between phenomenon and context relies on multiple sources of evidence.

Case studies are heuristic. In these studies, determined purposes are explored with appropriate findings (Kılınç; 2007). In this study, 13 industrial enterprises directly applying reverse logistics and operating in food, textile, metal, forest products, paper industries in Corlu, Cerkezkoy and Luleburgaz were examined and studied in their native environment (see. Yin, 2003: 2; Yıldırım and Şimşek, 2008: 290; Lodico et al., 2010). The data obtained from the other 10 enterprises were also included in the study. In this regard, the study employs an "*integrated multi-case design"* (Yıldırım and Şimşek, 2008: 291-292). The most commonly used sampling method in qualitative research is "*Purposive Sampling*". For the purposes of this study, "*the maximum diversity sampling*" was used, which is a purposive sampling method. The purpose is not to generalize, but describing similar and different aspects of various enterprises (Yıldırım and Şimşek,

2008: 108-109). In addition, each industrial enterprise in this study was selected for creating variety. Representatives of enterprises located in the districts of Corlu and Cerkezkoy of the province of Tekirdag and the Luleburgaz district of the province of Kirklareli constitute the population of the study. “The size of the population is not known for sure” (Kayar, 2015: 72).

Data Collection Tool

Survey form, interview and observation methods were used for data collection purposes. An Interview Form applied according to Unstructured Interview Method was also used in the study. “Unstructured Interview Form consists of open-ended questions and it is a strong tool that provides rich and valuable data and in-depth information” (Punch, 2001: 169). The author also emphasizes that “questions and themes to be discussed in this interview" are determined. Audio recording, video recording or note-taking techniques were used during interviews. The interview form contains researcher’s open-ended questions regarding reverse logistics (recovery and recycling) (see. Yıldırım and Şimşek, 2008: 120-121).

Data Analysis

Merriam (1998) states that researchers use interviews, observations and documents in qualitative research to understand various concepts and relationships between them. Some of the resulting expressions and concepts were encoded deeply and discourse analysis was applied. “Data encoding is one of the stages of the discourse analysis” (Mil, 2007: 160). Punch (2011: 194-195) define these codes as “labels, names or descriptions of names”. Baş and Akturan (2008: 32) state that “the aim of discourse analysis is to explain and interpret the data”. The author points out that “discourse is made up of human experiences and important parts of these experiences are interpreted”. Unit of analysis is words, phrases, sentences or expressions used by each participant.

Validity, Reliability, Generalization

The data used in the study were obtained via the Unstructured Interview Form and the survey form. In addition, an observation form, a questionnaire, websites of enterprises and personal experiences of the researcher were included in the study to support answers given to interview questions for “data diversification” purposes (Darke et al. 1998; Yin 2003; Yıldırım and Şimşek, 2008). Findings related to activities performed by industrial enterprise during the reverse logistics implementation process and answers given by participants were checked for consistency and plausibility. Expressions and sentences used by participants were directly quoted. Research findings and results were submitted to the approval of the respondents and necessary corrections were made. This way, a chain of evidence was created. Yin (2003: 35) and Yıldırım and Şimşek (2008: 289) state that these factors support the structural validity of the research in case studies.

Empirical Data and Analysis

Experiences of participants related to reasons of reverse logistics implementation in various industrial enterprises were identified in the study.

Demographics Features

According to findings obtained from the survey form used in the study, 82.65 of the participants were male, 60.9% were between the ages of 31 and 40, 87% were married and 73.9% had a bachelor's degree. 18.18% of the participants were chemical engineers, 13.65% were economics graduates and 18.18% were vocational high school graduates. Also, 47.8% of the participants had more than 16 years of experience and 43.5% had been working as the department head. 39.1% of the participants had been working in Tekirdag for 7-10 years and 30.4% were with the same enterprise for 3-6 years. 11 of the enterprises included in the study were established in before 2000, whereas 12 were established after 2000 (Table 1).

Table 1: Findings Related to Demographic Features (n = 23)

Variables	Groups	F	%	Variables	Groups	F	%
Gender	Male	19	82.6	**Time of service in Tekirdağ**	Less than 3 years	3	13,0
	Female	4	17,4		3-6 years	5	21,7
Age	30 and below	3	13,0		7-10 years	9	39,1
	31-40	14	60,9		11-14 years	2	8,7
	41-50	5	21,7		15 years and above	4	17,5
	51-60	1	4,3	**Years worked in the enterprise**	Less than 3 years	5	21,7
Marital Status	Married	20	87		3-6 years	7	30,4
	Single	3	13,0		7-10 years	6	26,1
Education	High school	5	21,7		11-14 years	3	13,0
	Associate's Degree	1	4,3		15 years and more	2	8,8
	Bachelor's Degree	17	73,9				
Faculty/Vocational School	Chemical Engineer	4	18,18	**The Year of Establishment of the Enterprise**	1958	2	9,10
	Mechanical Engineer	1	4,55		1973	1	4,55
	Logistics Department	1	4,55		1976	1	4,55
	Aircraft Engineer	1	4,55		1978	1	4,55
	Department of Economics	3	13,65		1983	2	9.10
	Department of Business Administration	1	4,55		1984	1	4,55
	Electrical-Electronics Engineer	1	4,55		1990	1	4,55
	Environmental Engineer	1	4,55		1991	2	9.10
	Agricultural Engineer	1	4,55		1994	1	4,55
					1997	1	4,55
	Architect	1	4,55		2004	1	4,55
	International Relations	1	4,55		2005	1	4,55
	Bachelor's Degree (unspecified)	1	4,55		2007	2	9.10
	Associate's Degree (Textile-Dye)	1	4,55		2008	2	9.10
	Industrial Vocational High School	4	18,18		2009	1	4,55
Seniority	5 years and below	5	21,7		2011	2	9.10
	6-10 years	1	4,3		2012	1	4,55
	11-15 years	6	26,2				
	16 years and above	11	47,8				
Position	Factory Manager	3	13,0				
	Warehouse Manager	4	17,1				
	Business Manager	2	8,7				
	General Manager	2	9,1				
	Department Head	10	43,5				
	Consultant	2	8,7				

Source: Kayar, 2015: 79-80.

Reverse Logistics Activities

According to Table 2, 38.1% of the enterprises had been applying reverse logistics activities for 19 or more years. Activities performed by the enterprises during the reverse logistics process are given in Table 3 according to priority.

Table 2: Time of Reverse Logistics Activities Application

Variable	Groups	F	%
Time of Reverse Logistics Appliances	Less than 1 year	2	9,5
	1-3 years	2	9,5
	4-6 years	2	9,5
	7-9 years	3	**14,3**
	10-12 years	1	4,8
	16-18 years	3	**14,3**
	19 years and plus	8	**38,1**
	Total	22	100

Source: Kayar, 2015: 81.

Table 3: Most Commonly Performed Activities During Reverse Logistics Process

Most Commonly Performed Activities During Reverse Logistics Process	1st Priority	2nd Priority	3rd Priority	Total
Organizing Customer Returns	**56,3%**	31,3%	12,5%	100%
Donating	0%	0%	0%	
Storing	50%	**50%**	0%	
Remanufacturing/Restoration	50%	40%	10%	
Repackaging and Reselling Like New	16,7%	16,7%	66,7%	
Reselling Without Any Changes	16,7%	33,3%	50%	
Selling to Outlet Center	0%	0%	0%	
Selling to Intermediaries	0%	14,3%	**85,7%**	
Recycling	27,3%	36,4%	36,4%	
Disposal	0%	**50%**	50%	
Other	0%	0%	100%	

Source: Kayar, 2015: 81

According to Table 3, the highest share belongs to "Organizing Customer Returns" with 56.3% among the first priority activities performed during reverse logistics process. The highest share among the third priority activities belongs to "Selling to Intermediaries" with 85.7%. The highest share among second priority activities belong to "Storing" and "Disposal", both having 50%. Rogers and Tıbben-Lembke (2001) indicates that most commonly performed reverse logistics activities in enterprises are "remanufacturing, disposal, repackaging and selling and storing".

Reasons of Reverse Logistics Implementation

In terms of enterprises' reasons of reverse logistics implementation, the highest share among first priorities belongs to "Increasing Customer Satisfaction" with 62.5% according to Table 4. "Capturing Competitive Advantage" had the highest share among second priorities with 72.7%, whereas the highest share belongs to "Supporting Other Solutions and Customer Services" and "Increasing Profits", both having 50%. Thanks to reverse logistics operations, enterprises are able to reduce customer risks, give confidence to consumers and thus gain competitive power.

Table 4: Reasons for Starting Reverse Logistics Activities

Reasons for Starting Reverse Logistics Activities	1st Priority	2nd Priority	3rd Priority	Total
Capturing Competitive Advantage	9,1%	**72,7%**	18,2%	100%
Increasing Customer Satisfaction	**62,5%**	25%	12,5%	
Application Became Mandatory	25%	41,7%	33,3%	
Supporting Other Solutions and Customer Services	0%	50%	**50%**	
Due to Awareness of Environmental Responsibility	43,8%	12,5%	43,8%	
Increasing Profits	33,3%	16,7%	**50%**	

Source: Kayar, 2015: 83.

In his doctoral dissertation, Dissanayake (2007) lists enterprises' reasons of reverse logistics as "customer services, strategic issues and legal requirements". Enterprises implement reverse logistics operations due to "economic reasons, marketing reasons, legal reasons, assert protection and corporate responsibility" (Şengül, 2011: 413-414). It is especially pointed out that social responsibility and legislative regulations creates consumer trust for enterprises (Uslu and Akçadağ, 2012). In addition, enterprises try to capture a competitive advantage against their rivals with reverse logistics operations (Wang and Hsu; 2010).

Findings Based on Observation

Representative who participated in the study were observed in their original environment and they answered questions regarding activities performed during reverse logistics process and reasons behind these activities. Interviews started with a warm welcome and questions were answered in a friendly way. Examples were provided for views of workshops within the enterprise and manufacturing processes. Reverse logistics activities applied for external storage and shipping processes and in relation to working conditions of employees were observed. In this region, where enterprises value human health, reasons of reverse logistics implementation were explained with examples such as customer satisfaction, staying in market, etc. Enterprises operating in food, forest products, textile, glass, metal, recycling and distribution (warehouse services) industries emphasized that they carried out recovery-recycling processes with utmost care and gave great importance to environment.

Findings Related to Interviews

Findings obtained during the interview stage of the study are summarized as recovery and return reasons.

Recovery Reasons

Enterprises summarize their reasons of reverse logistics implementation under the titles of economic reasons, legal reasons, environmental concerns and corporate responsibility. These can be briefly explained as follows: In terms of economic reasons, enterprises want to reuse materials to be disposed of or recycled (sand, iron, cement, concrete, gravel, brick, cable, copper, armature waste) as raw material. Enterprises strongly emphasized that they wanted to provide jobs in the organized industrial zone, improve the environmental awareness on an individual and social level and maintain demand-supply balance with conscious production. In terms of legal reasons, the enterprises included in the study stated that their main goal was to learn more about the market and about themselves. They also expressed that they aimed to organize customer complaints with an increasing performance to ensure customer satisfaction and answer inquiries in less time and with higher quality and also comply with customer rights. In terms of environmental concerns and corporate responsibility, the enterprises stated that they aimed to achieve a better position with increased success rates, reduce costs in relation to disposal, and ensure corporate development through improvement activities.

Return Reasons

Today, According to enterprises, the most common reasons of return are given in Table 5.

Table 5: Return Reasons

Return Reasons	
Dissatisfaction	Manufacturing defect
Customer complaints	Quality control rejects
Faulty products	Damages and crushes during shipping
Missing products	Canceled products
Expired products	Raw material and manufacturing surpluses
Excessive customer orders	

Source: Kayar, 2015: 94.

Returns encountered by enterprises examined within the scope of the study are shown in Table 6. These can be grouped as distribution returns, stock balancing returns, functional returns and commercial returns.

Table 6: Return Types

Distribution Stage Returns
Products damaged during cargo transportation (breakage, cracking, deterioration, warping, etc.)
Wrong delivery (wrong product, surplus products)
Products not approved by customer's quality control
Products with wrong barcodes
Products that were not distributed under suitable transportation and air conditions
Traffic accidents
Stock Balancing Returns
Mistakes by warehouse responsible
Failure to carry out in detail analysis of products to be manufactured
Purchasing department's lack of care regarding received orders
Functional Returns
Incomplete or excessive delivery of the *main order*
Packing problem (failure to pack the order properly)
Customer's failure to state requests in detail in *special orders* (regarding packaging, material, etc.)
Damages occurred during *secondary distribution* carried out by customer/distributor
Short delivery to customer due to *counting components of the product incorrectly* in enterprise warehouse
Stowage complaints regarding enterprise's loading procedure
Delivery of products with different quality levels to customer
Return of products due to use of unsuitable cleaning materials
Confusing sequence of process and returning to the initial process in the production area
Customer Returns
Customer returns due to inconsistent testing methods in quality laboratories of enterprises that use recycled raw materials
Return of products under warranty
Return of expired products
Return of healthy and damaged products
Customer returns due to faulty cut in the production area
Returns due to failure to complete delivery within the time requested by customer
Returns due to faulty production
Packaging damages during transport
Products rejected by the quality control department of the customer
Customer returns due to production employees
Change or cancellation of order by customer on a date close to initial delivery date
Commercial Returns
Misdelivery or products damaged during transport
Returns due to problems in secondary loading during export
Seasonal products that were not consumed in time
Expired products

Source: Kayar, 2015: 98-102.

Costs incurred by enterprises during recovery-recycling activities are given in Table 7.

Table 71: Similar and Different Reverse Logistics Costs

Similar	Different
Shipping cost	Inventory loss cost
Labor cost	Transportation cost
Storage cost	Handling cost

Source: Kayar, 2015: 104

Similar and different customer returns are shown in Table 8.

Table 8: Similar and Different Customer Returns

Similar Customer Returns	**Different Customer Returns**
Returns due to faulty production	Returns related to holding/stowage
Packaging related returns	Returns due to inappropriate ambient air and incorrect racking conditions
Products failed to meet quality standards	Returns due to canceled orders
Returns from end-consumer	Returns due to regulation change
Returns due to cosmetic defects occurred during transportation	Returns due to product end of life or customer dissatisfaction
Returns due to failure to meet customer expectations	Returns made at a certain stage of product use seen in products with refund advantage
Returns due to missing products in package – pallet	Change or cancellation of order by customer on a date close to initial delivery date
Returns due to shopworn products	Customer returns due to production employees
Returns due to customer's lack of storage space	Returns due to failure to complete delivery within the time requested by customer
End of use returns	Customer returns due to faulty cut in the production area
End of life returns	

Source: Kayar, 2015: 102.

Conclusion

This study investigates what kind of reverse logistics activities are carried out by enterprises in various industries for what reasons. The study was performed with enterprises implementing reverse logistics located in the districts of Corlu and Cerkezkoy of the province of Tekirdag and the Luleburgaz district of the province of Kirklareli. Findings are based on answers given to questions in the interview form. Personal observations and experiences were included in the study since the researcher lives in the region, knows and is often in close contact with the enterprises. For enterprises, reverse logistics activities mean "recycling, reselling as new, remanufacturing, product refurbishing and cannibalization, and recovery-recycling". It was found as a result of the study that enterprises "reduce reverse logistics costs with waste collection, sorting and recycling and reuse products that lost their functions as raw material". Enterprises place great importance on the green image and social responsibility projects and contribute to improvement of environmental awareness. The majority of enterprises participating in the study were performing reverse logistics activities for 19 or more years. These activities are mostly used for "organizing customer returns, storing, disposal, and selling to intermediaries". Enterprise's reasons for implementing reverse logistics activities included "capturing competitive advantage, supporting customer services and increasing profits". Reasons that push enterprises toward recovery activities are "economic and legal reasons, environmental concerns and corporate responsibility". Common recycling reasons are "refunds, customer complaints, missing products, expired products, excessive orders by customers, canceled orders, manufacturing faults, shipping casualties and crushed products". Returns to enterprises can be categorized as "distribution returns, stock balancing returns, functional returns and commercial returns". These returns can be seen as *similar and different customer returns.* Reverse logistics which are not implemented by enterprise or which enterprises do not know how to implement return as increased costs. Among these costs, similar reverse logistics costs consist of labor and storage costs, whereas *different reverse logistics costs* consist of inventory loss cost, transportation and handling costs. Enterprises must provide reverse logistics training for their employees so that they can familiarize with stages in the reverse logistics process. Thus, the process can be improved by eliminating the lack of internal tracking and coordination related to reverse logistics. Researchers may conduct studies related to social, economic and psychological impacts of recovery-recycling operations in enterprises. Another topic of research may be investigation of failure to implement reverse logistics activities within enterprises and reasons why procedures cannot be applied in a timely manner.

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